'Plant Trial Design and Data Analysis'
Workshop Outline

Synopsis:

This interactive workshop will provide a broad overview of data-driven decision making using a decision-tree or logic flow diagram approach. The program will consist of two 2-hour interactive workshop sessions. Each session will be prefaced by some preliminary learning materials, including tasks to be completed prior to participants attending. The workshops themselves will be presented live, and will deliver further context and real-world examples, including the opportunity for participants to practice as they learn. Depending on the background of the attendees, examples might be sought directly from participants.

Pre-workshop activities:

1. Familiarise yourself with the learning outcomes and session topics below
2. Consider how the topics relate to your situation / job role / interests and what you hope to get out of the workshop
3. Download and install WinPython (**please allow at least 1 hour for installation**):
   a. WinPython is a free open-source portable distribution of the Python programming language for Windows 8/10 and scientific and educational usage) which we will be using for the interactive sessions
   b. We suggest version Winpython64-3.9.5.0.exe, available here: https://github.com/winpython/winpython/releases
      Please follow the "Installation Cheat Sheet" provided to install WinPython
   c. NOTE: you are free to use another Python distribution package / interface if you prefer

Learning outcomes:

Upon successful completion of this workshop, participants should be able to:

1. Identify how and when to make data-driven decisions
2. Understand what tools and methods are available and applicable for making data-driven decisions
3. Determine what data is required to make or assist in making a decision
4. Strategically plan and execute plant trials to generate any new data required
5. Collect, clean, analyse and interpret data from plant trials
6. Relate the outcomes of the analysis and interpretation back to the original decision
7. Understand data communication formats and how to select the most appropriate format to clearly and concisely convey the link between the data and the decision

Session 1: Wed 20th October 2021, 12pm
1. Introduction to data-driven decision making
2. Tools and methods for making data-driven decisions
3. What is data? Background and definitions
4. Planning your data
5. Generating new data
6. Real trial examples
7. Data preparation
8. Take-home activity #1 - trial design and data generation

Session 2: Wed 27th October 2021, 12pm
1. Review take-home activity
2. Data analysis
3. Interpretation (have you generated the information you need to make the decision?)
4. Data presentation
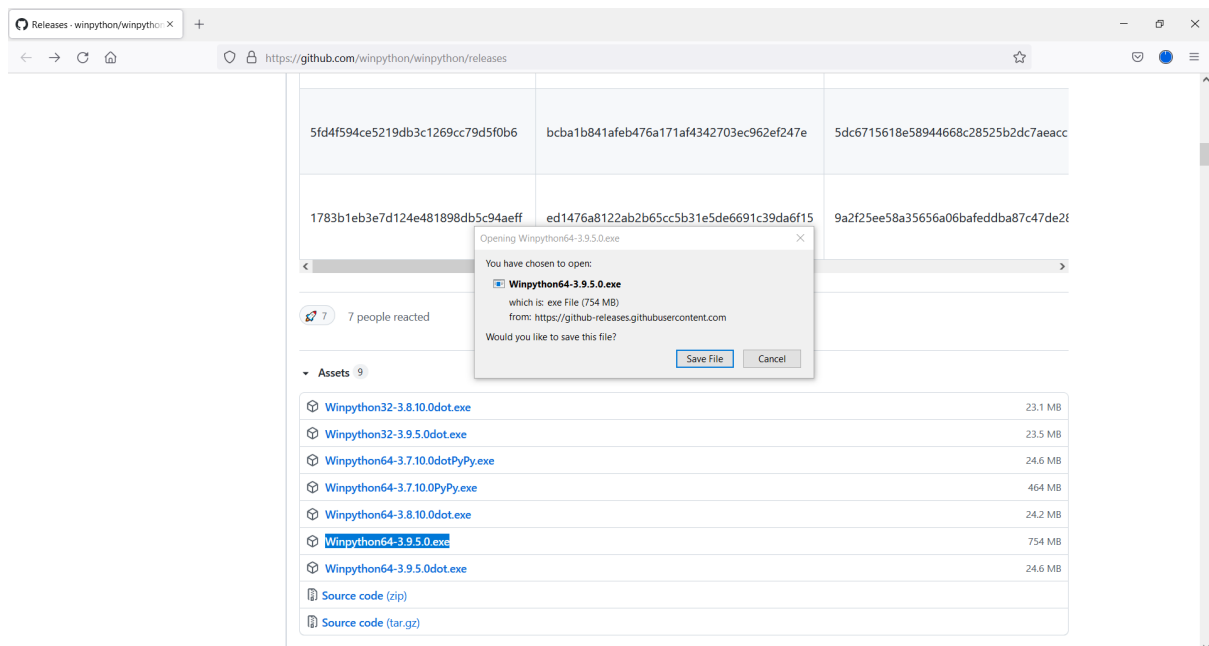5. Take-home activity #2 - data interpretation and decision making

WinPython 64 bit 3.9.5.0 Installation Cheat Sheet

1. Go to the WinPython download page

https://github.com/winpython/winpython/releases
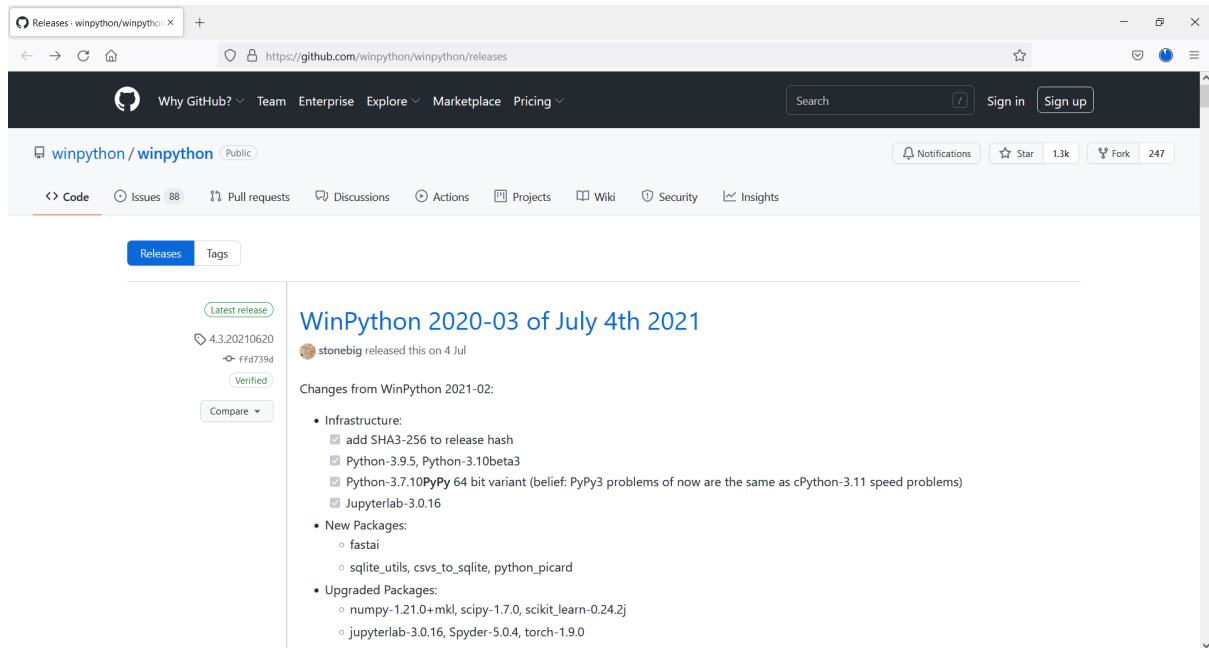
2. Scroll down to "Assets", expand if necessary, and click on Winpython64-3.9.5.0.exe. When prompted, save this file and wait for it to download.

3. When download has finished, find the installer (typically in your Downloads folder) and run the installer.


It will ask you for a place to extract it, by default will be in the folder you run it from. Because there are tens of thousands of small files, WinPython may require over 10 GB additional space due to the way some USB flash drives are formatted. Select where you want to install it, either on your computer's hard drive, or on a USB drive, and click Extract.
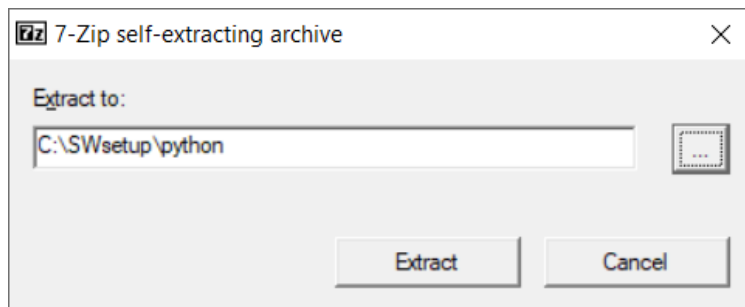
4. This process may take from 30min to an hour, as there are 4GB of many small files to extract. You can let this run in the background while you do other work.
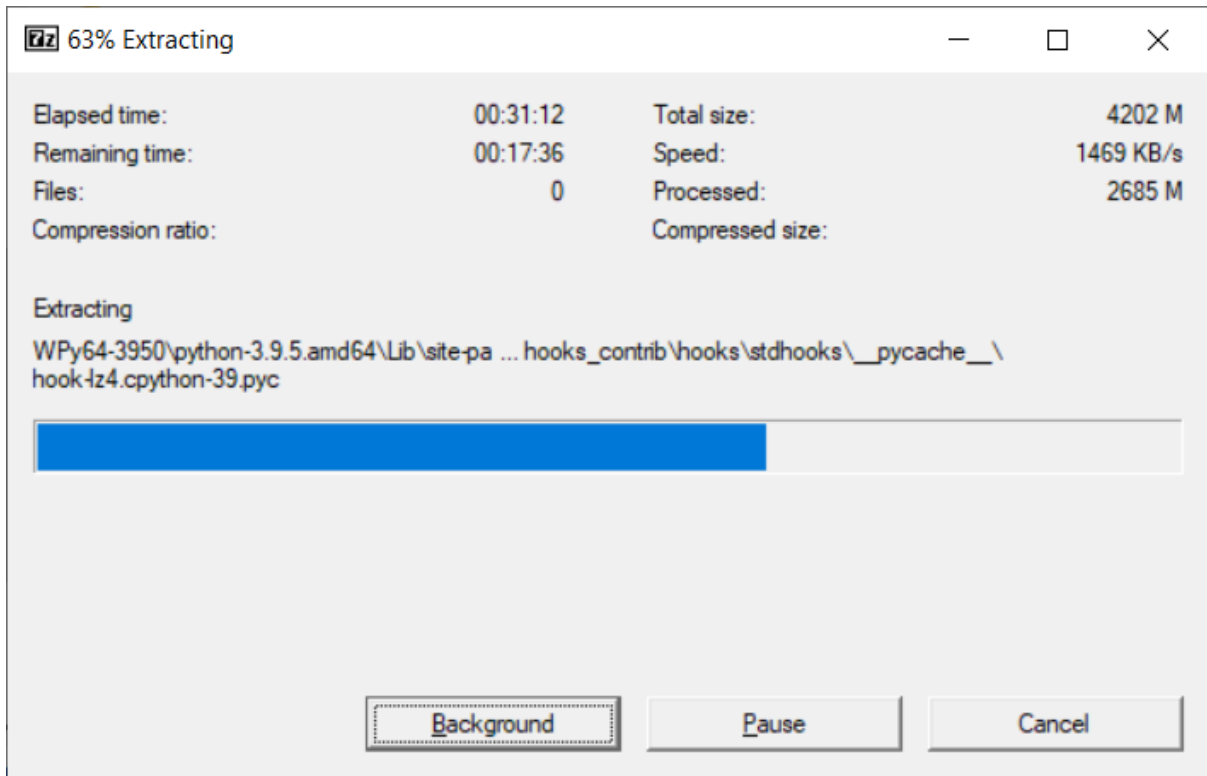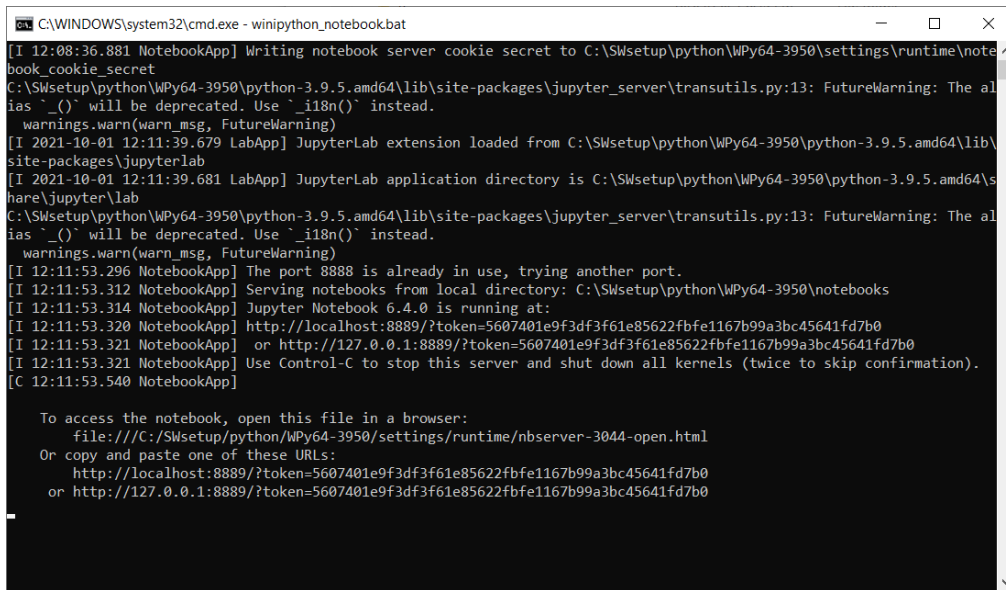
5. Once installation is complete, navigate to the folder where you installed WinPython. The "notebooks" folder is where the notebooks you create are saved by default.
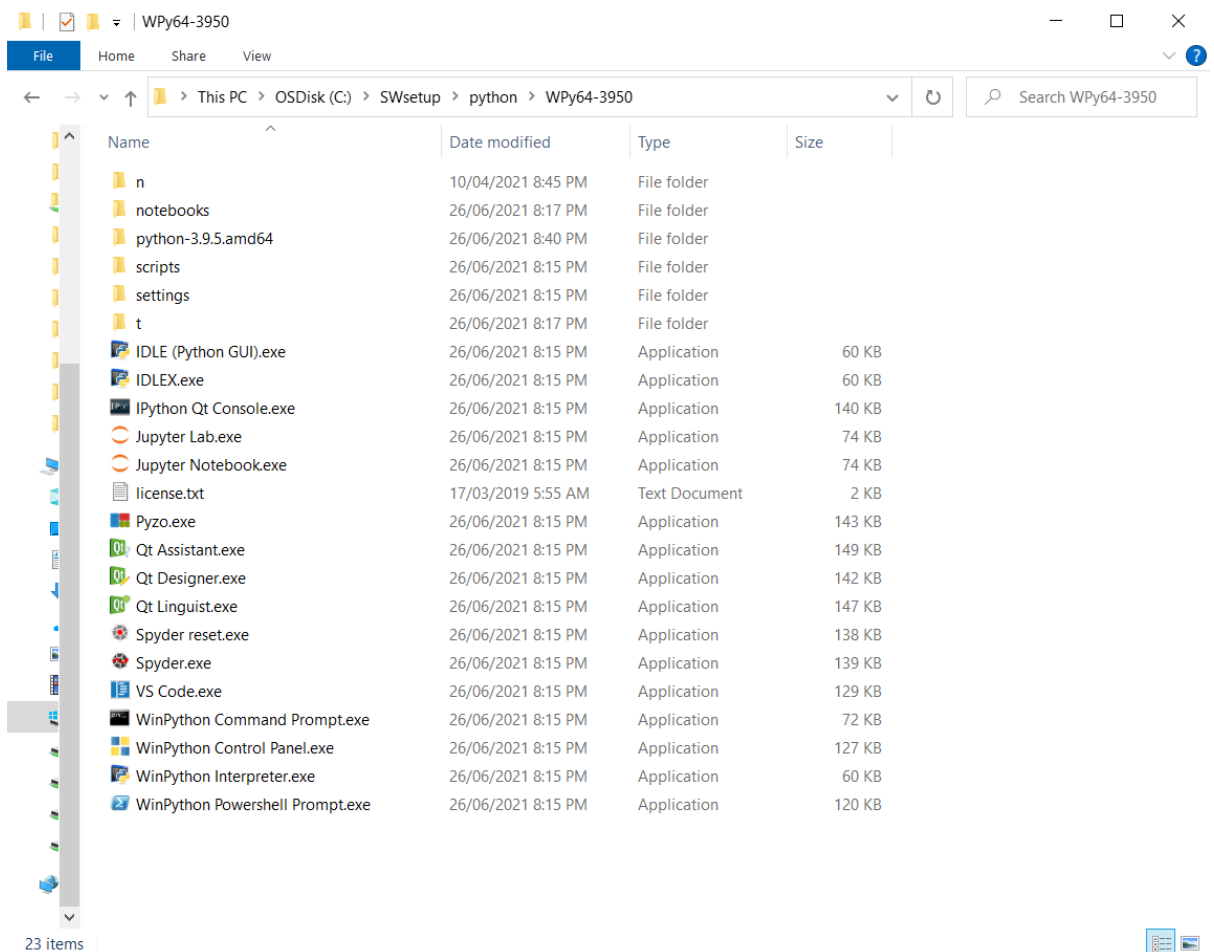
6. For this course we will be using the Jupyter Notebook interface to Python. It is a browser based interface, and allows you to run modular segments of code in logical blocks. It is a common tool for exploratory and one-off data analysis with python
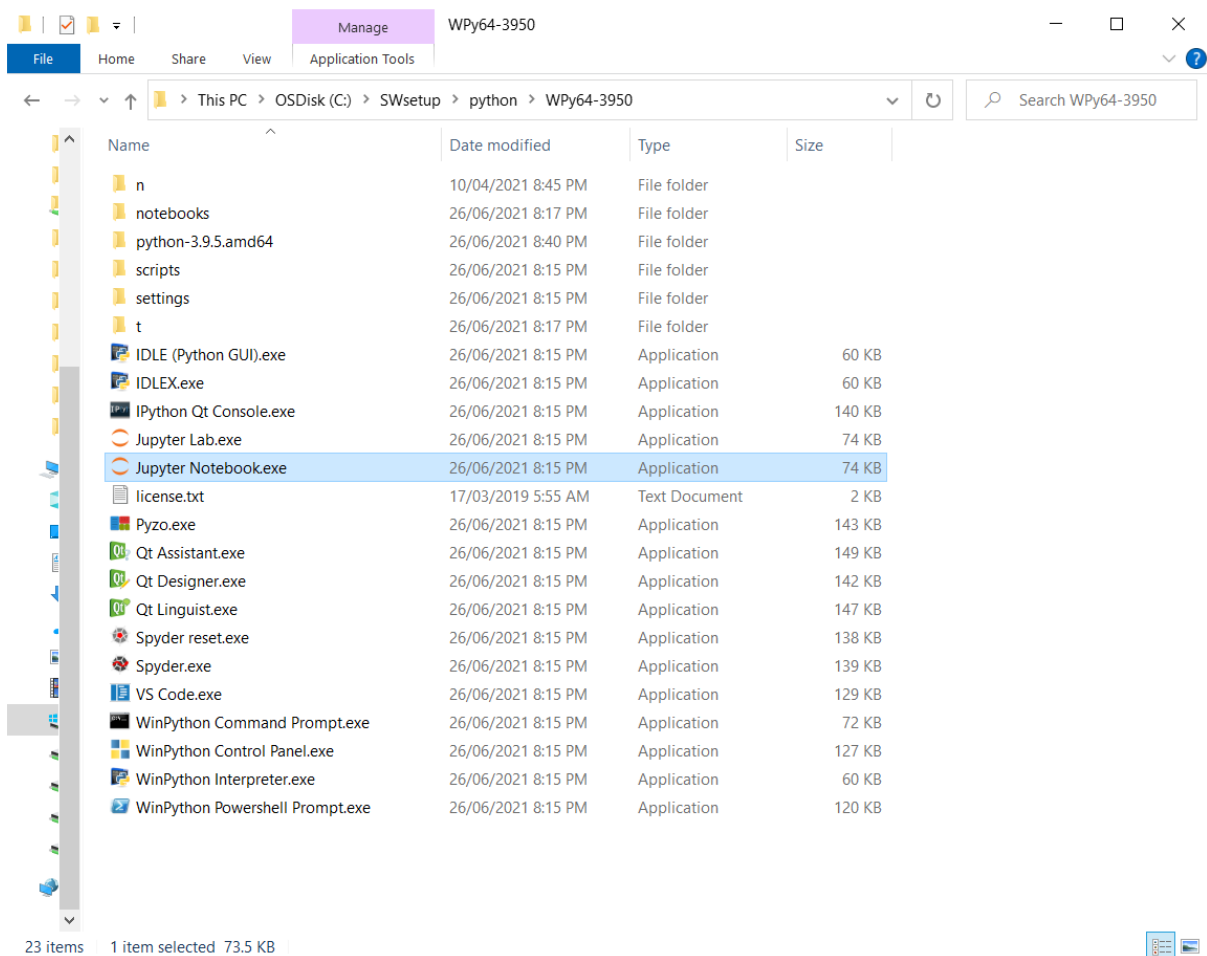
Once you run it, it will open a window that looks similar to below. This needs to stay open while running Jupyter Notebook.

7. Once is it running, it will open a browser window as below. It will display the "notebooks" folder as you saw above.

8. Now we can test out python for the first time. Let's create a new notebook by clocking on "New" then Python 3.

10. Type print('Hello world!') into the box as shown below, then click the "Run" button up the top! Congratulations, you have written your first python code!